

Bendix® SR-5™ Trailer Spring Brake Valve

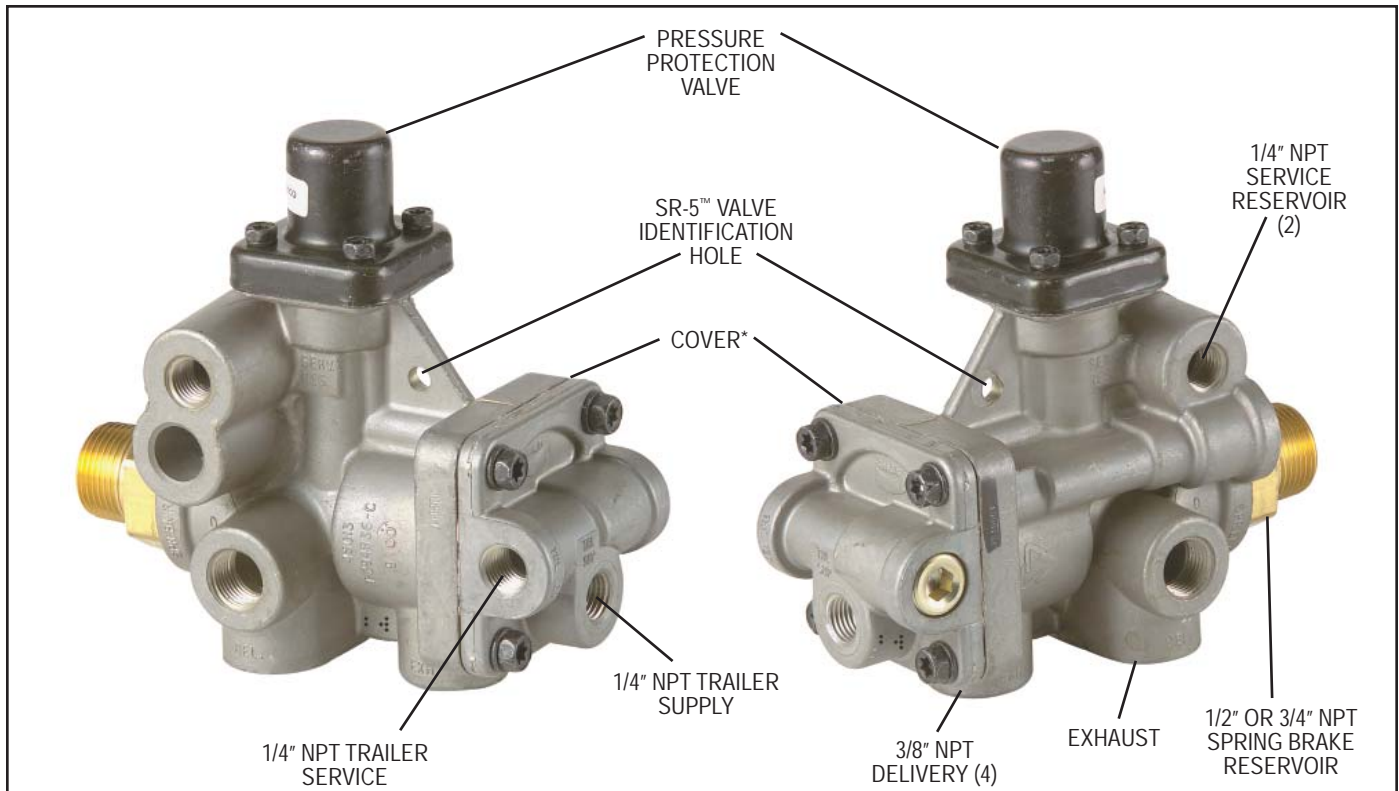


FIGURE 1 - BENDIX® SR-5™ TRAILER SPRING BRAKE VALVE (*SHOWN WITH OPTIONAL ANTI-COMPOUNDING COVER)

DESCRIPTION

The Bendix® SR-5™ valve is a reservoir-mounted trailer valve that can control up to four spring brake actuators during parking or emergency applications. It has the following capabilities:

- Automatically applies trailer spring brakes in the event of a breakaway or trailer supply line failure.
- Protects trailer reservoir(s) air pressure in the event of a breakaway or trailer supply line failure.
- Allows no automatic trailer spring brake application with air pressure loss in trailer reservoir(s).
- Allows the trailer spring brakes to be applied and released repeatedly with a failed trailer reservoir(s):
- Optional anti-compounding-prevents an overriding service brake signal while the trailer supply line is at atmospheric pressure.
- Does not allow service system charging if a failure occurs in the parking brake circuit.

PORTS

1 - 1/2" or 3/4" NPT Spring Brake Reservoir Mounting (SPR BK RES)

1 - 1/4"-18 NPT Trailer Supply (TRL SUP)

1 - 1/4"-18 NPT Trailer Service (TRL SER)

4 - 3/8"-18 NPT Delivery (DEL)

2 - 1/4"-18 Service Reservoir (SERV RES)

1 - Exhaust (EXH)

The SR-5™ valve appears very similar to the Bendix® SR-2™ valve. Both valves consist of a die-cast aluminum body and cover, pressure protection valve, and reservoir-mounting nipple. However, Figure 1 notes the distinguishing characteristic of the SR-5™ valve—a hole drilled into the flat surface between the pressure protection valve and the body.

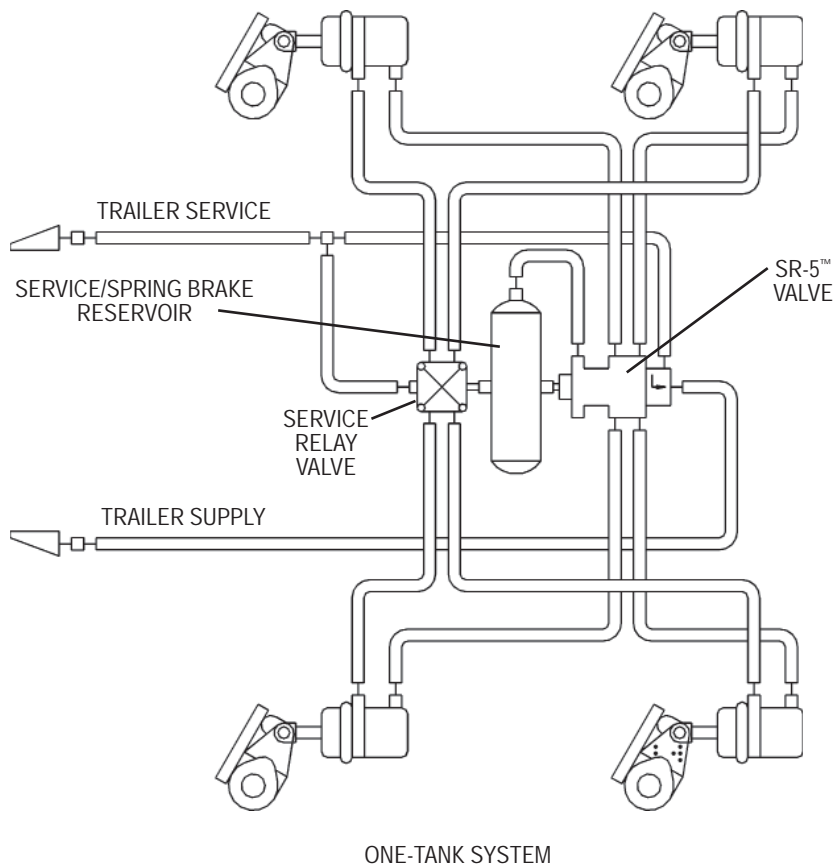
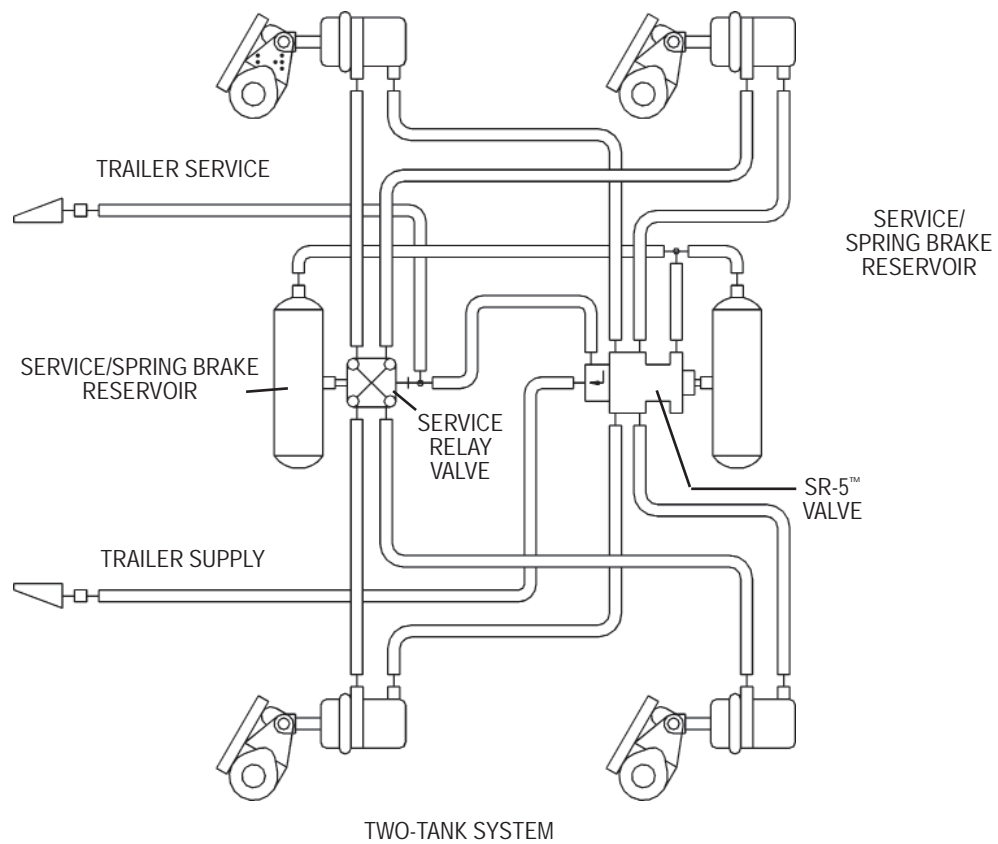


FIGURE 2 - TYPICAL SYSTEM SCHEMATICS WITH BENDIX® SR-5™ TRAILER SPRING BRAKE VALVE

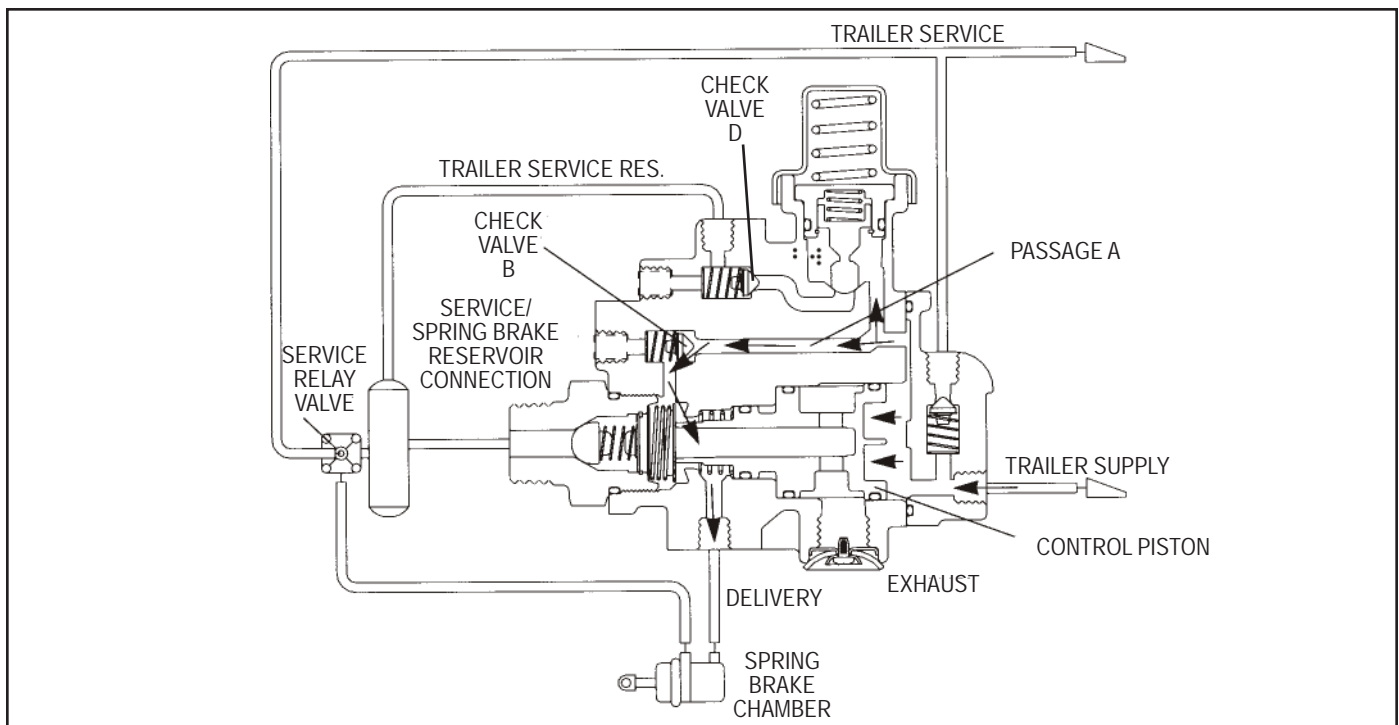


FIGURE 3 - CHARGING BELOW 70 PSI

OPERATION

CHARGING BELOW 70 PSI (SEE FIGURE 3)

Air flows through the trailer supply line, enters the Bendix® SR-5™ valve trailer supply port, and moves the control piston. The control piston contacts the control inlet/exhaust valve, sealing off the piston's exhaust passage.

As piston travel continues, the control inlet valve opens. Air acting on the control piston also flows through passage A, unseating check valve B, and flowing past the open control

inlet valve. This air flows into the spring brake cavities, releasing the spring brakes.

CHARGING ABOVE 85 PSI (SEE FIGURE 4)

Air pressure acting on the control piston and flowing through passage A also acts on pressure protection valve C. At approximately 85 psi, valve C opens. This allows the air to flow past check valve D and charge the trailer reservoir(s). The trailer braking system is now in the normal run mode. Service braking occurs through the trailer service relay valve.

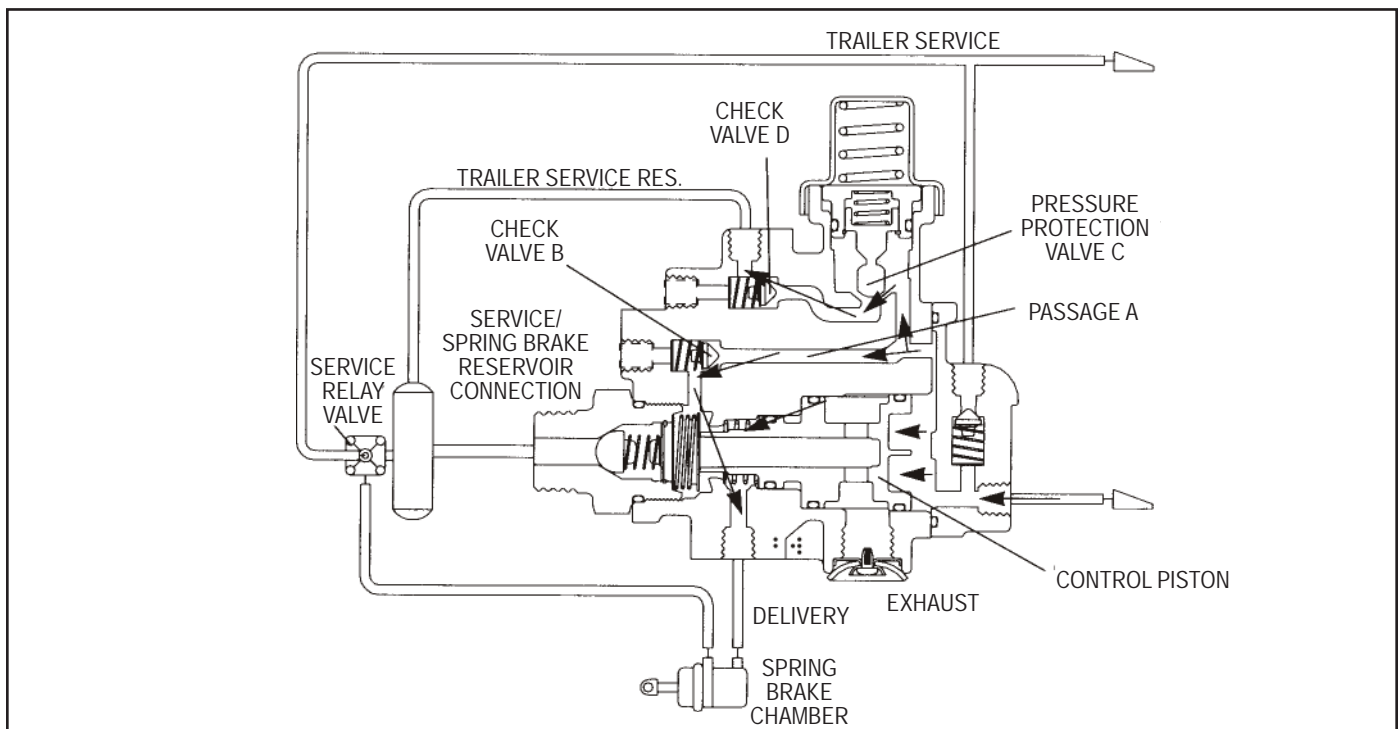


FIGURE 4 - CHARGING ABOVE 85 PSI

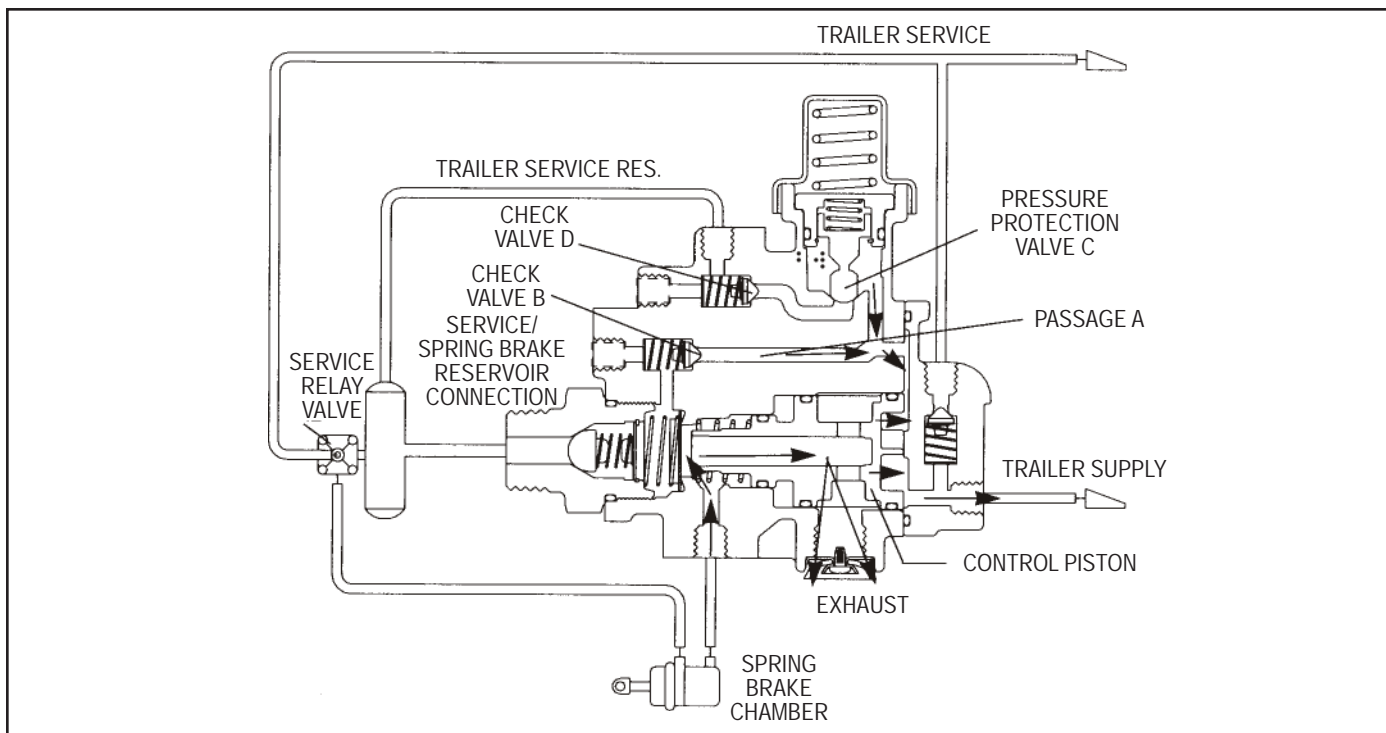


FIGURE 5 - PARK APPLICATION

PARK APPLICATION (SEE FIGURE 5)

To park the trailer, either the trailer air supply valve or the system park control valve (in the tractor) is actuated. This vents the trailer supply line. The control piston, no longer under supply pressure, is moved by air pressure on its delivery side. This allows the control piston to move to the exhaust position. The control inlet valve closes and the exhaust valve opens, allowing air from the spring brakes to exhaust through the passage in the control piston and apply the brakes. Check valves B and D close, preventing trailer reservoir air pressure loss through passage A.

PARK RELEASE WITH TRAILER CHARGED

(SEE FIGURE 6)

To release a park application with the trailer charged, the trailer supply valve (in the cab) is actuated. Air flows through the trailer supply line and enters the Bendix® SR-5™ valve trailer supply port. With a minimum of 55 psi on the control piston, the piston will move, sealing its exhaust passage. As piston travel continues, the inlet valve opens. Reservoir air (approx. 110 psi) then flows through check valve F, past the open inlet, and out to the spring brake chambers to release the brakes.

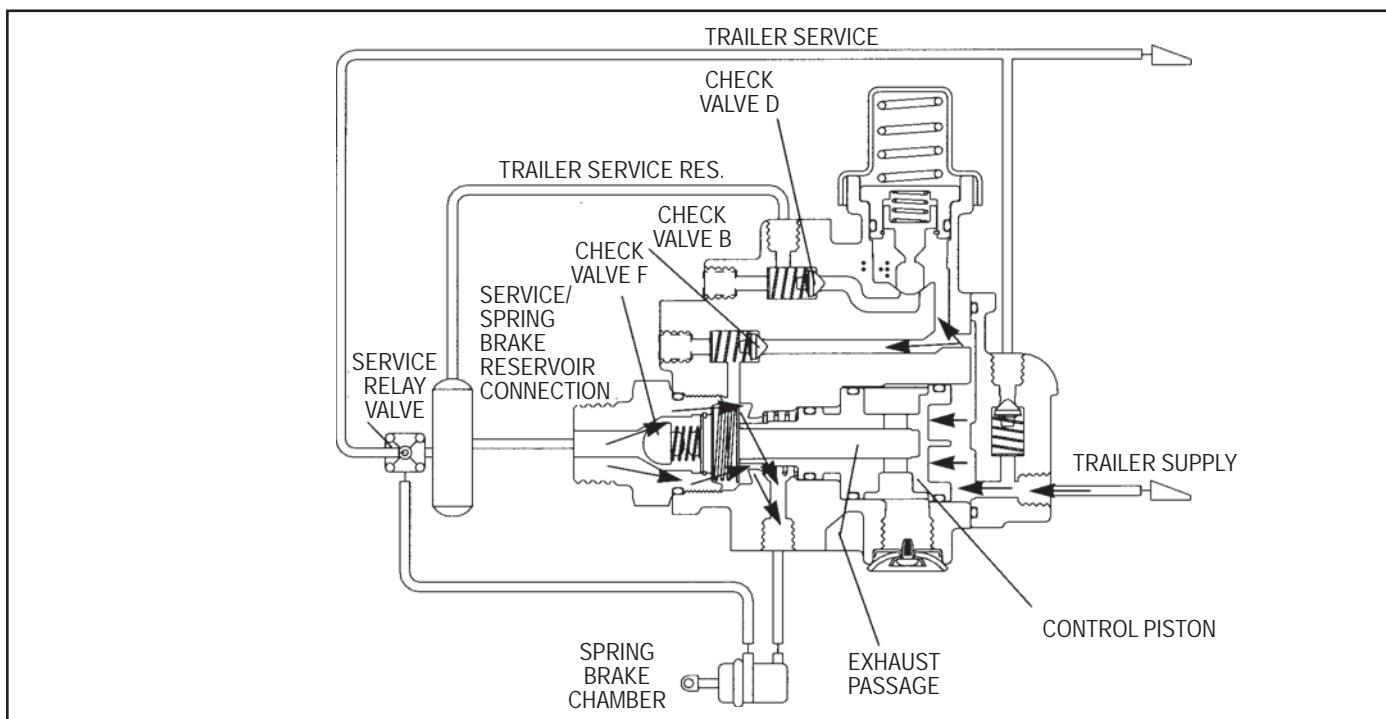


FIGURE 6 - PARK RELEASE WITH TRAILER CHARGED

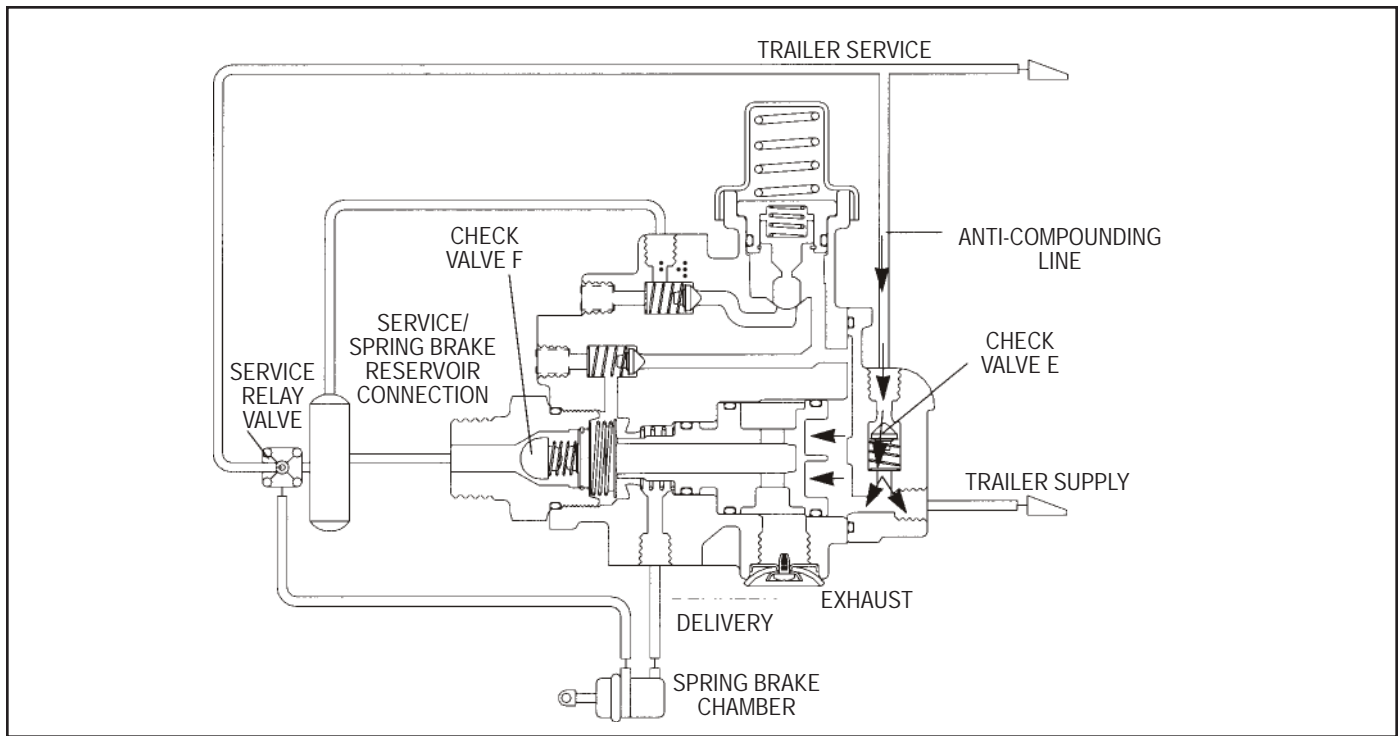


FIGURE 7 - OPTIONAL ANTI-COMPOUNDING

Note that pressure protection valve C will open if trailer supply air is greater than 70 psi. But check valves B and D will not open unless release pressure from the tractor exceeds trailer reservoir pressure.

ANTI-COMPOUNDING (SEE FIGURE 7)

The Bendix® SR-5™ valve has an optional anti-compounding feature. (See Figure 7.) A single check valve in the SR-5™ valve cover prevents brake compounding (simultaneous spring brake and service brake application), which creates extra load on foundation brake components.

If a trailer service application is being made and at the same instant a park application is made, air in the service line flows through single check valve E in the SR-5™ valve cover. Pressure is maintained on the control piston, while air also flows out the trailer supply line and exhausts through the tractor protection control. Future compounding is prevented by the closed tractor protection valve.

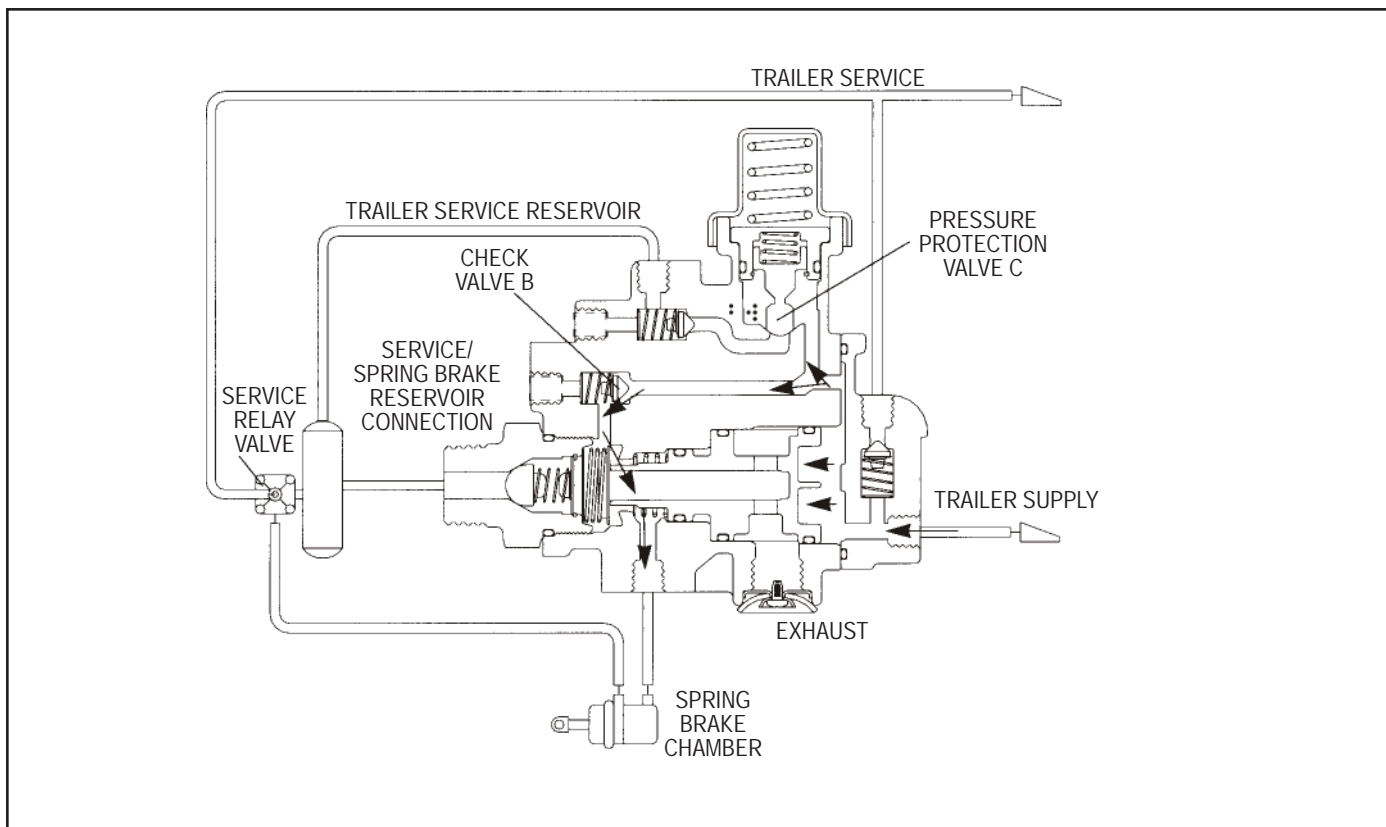


FIGURE 8 - FAILED TRAILER RESERVOIR

FAILED TRAILER RESERVOIR (SEE FIGURE 8)

Should trailer reservoir pressure be lost, trailer service braking is no longer available. Pressure protection valve C will close at approximately 70 psi (minimum), retaining air pressure in the trailer supply line.

The air held by the pressure protection valve will continue to hold the control piston's inlet valve open, supplying air to the spring brakes. Thus, no automatic spring brake application occurs. However, trailer supply line air can be used to apply and release the trailer spring brakes repeatedly.

PREVENTIVE MAINTENANCE

Important: Review the Bendix Warranty Policy before performing any intrusive maintenance procedures. A warranty may be voided if intrusive maintenance is performed during the warranty period.

No two vehicles operate under identical conditions, as a result, maintenance intervals may vary. Experience is a valuable guide in determining the best maintenance interval for air brake system components. At a minimum, the Bendix® SR-5™ valve should be inspected every 6 months or 1500 operating hours, whichever comes first, for proper operation. Should the SR-5™ valve not meet the elements of the operational tests noted in this document, further investigation and service of the valve may be required.

SERVICE CHECKS

1. Remove any accumulated contaminants. Visually inspect the valve's exterior for excessive corrosion or physical damage. Repair/replace the valve as necessary.
2. Inspect all air lines connected to the valve for signs of wear or physical damage. Repair/replace as necessary.
3. Test air line fittings for excessive leakage and tighten or replace as necessary.

OPERATIONAL AND LEAKAGE TESTS

Check the tractor dash gauge against a gauge known to be accurate before performing these tests. Connect the tractor air lines to the trailer on which the SR-5™ valve is to be tested. Block all wheels or hold the vehicles by means other than air brakes.

1. Install a gauge in the trailer reservoir(s). Build tractor and trailer to full system pressure by placing the park control valve and the trailer air supply valve in the charge position. As system pressure reaches approximately 75-95 psi, the trailer spring brakes should also build up to approximately 75-95 psi before the reservoir(s) begin to charge.
2. When full system pressure is reached, and the spring brakes are fully released, apply a soap solution to the SR-5™ valve exhaust port and the vent. A 1" bubble in 5 seconds is permissible.

GENERAL SAFETY GUIDELINES

WARNING! PLEASE READ AND FOLLOW THESE INSTRUCTIONS TO AVOID PERSONAL INJURY OR DEATH:

When working on or around a vehicle, the following general precautions should be observed at all times.

1. Park the vehicle on a level surface, apply the parking brakes, and always block the wheels. Always wear safety glasses.
2. Stop the engine and remove ignition key when working under or around the vehicle. When working in the engine compartment, the engine should be shut off and the ignition key should be removed. Where circumstances require that the engine be in operation, **EXTREME CAUTION** should be used to prevent personal injury resulting from contact with moving, rotating, leaking, heated or electrically charged components.
3. Do not attempt to install, remove, disassemble or assemble a component until you have read and thoroughly understand the recommended procedures. Use only the proper tools and observe all precautions pertaining to use of those tools.
4. If the work is being performed on the vehicle's air brake system, or any auxiliary pressurized air systems, make certain to drain the air pressure from all reservoirs before beginning **ANY** work on the vehicle. If the vehicle is equipped with a Bendix® AD-IS® air dryer system or a dryer reservoir module, be sure to drain the purge reservoir.
5. Following the vehicle manufacturer's recommended procedures, deactivate the electrical system in a manner that safely removes all electrical power from the vehicle.
6. Never exceed manufacturer's recommended pressures.
7. Never connect or disconnect a hose or line containing pressure; it may whip. Never remove a component or plug unless you are certain all system pressure has been depleted.
8. Use only genuine Bendix® brand replacement parts, components and kits. Replacement hardware, tubing, hose, fittings, etc. must be of equivalent size, type and strength as original equipment and be designed specifically for such applications and systems.
9. Components with stripped threads or damaged parts should be replaced rather than repaired. Do not attempt repairs requiring machining or welding unless specifically stated and approved by the vehicle and component manufacturer.
10. Prior to returning the vehicle to service, make certain all components and systems are restored to their proper operating condition.
11. For vehicles with Automatic Traction Control (ATC), the ATC function must be disabled (ATC indicator lamp should be ON) prior to performing any vehicle maintenance where one or more wheels on a drive axle are lifted off the ground and moving.

3. Place the trailer air supply valve in the exhaust position. The spring brakes should apply. Disconnect the trailer supply line and apply a soap solution to check for leaks. A 1" bubble in 5 seconds is permissible.
4. Reconnect the trailer supply hose coupling and recharge the trailer system. The spring brakes should release. Shut off the engine. Open the trailer reservoir drain cock. The tractor air system should bleed down to approximately 70 psi. The trailer spring brakes should remain released. After the system is stabilized, leakage at the open drain cock should not exceed a 1" bubble in 5 seconds.
5. If the Bendix® SR-5™ valve does not function as described; or if leakage is excessive, repair the valve, or replace with a genuine Bendix service replacement valve.

REMOVAL

1. Identify and mark or label all air lines and their connections on the SR-5™ valve. Then disconnect the air lines.
2. Remove the SR-5™ valve from the reservoir.

INSTALLATION

1. Install the SR-5™ valve on the reservoir.
2. Reconnect all air lines to the valve using the identification made in REMOVAL step 1.
3. Perform OPERATIONAL AND LEAKAGE TESTS before placing the vehicle back in service.

DISASSEMBLY

The following procedure is for reference only. Always have the appropriate maintenance kit on hand, and use its instructions in lieu of those presented here. Refer to Figure 9 throughout the procedure.

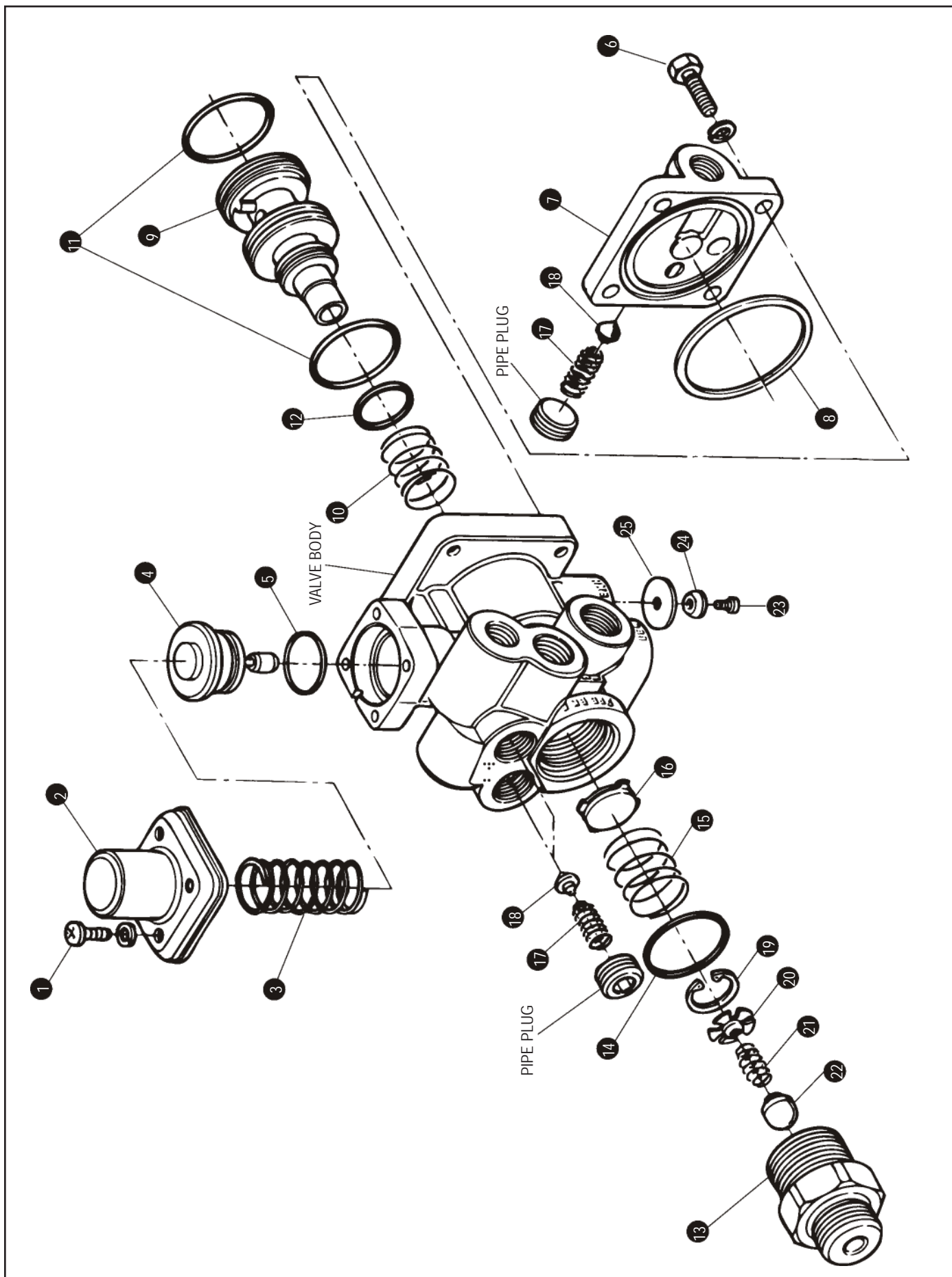


FIGURE 9 - EXPLODED VIEW

1. Remove the four screws (1) that secure the spring retainer (2) to the valve body. Note that the retainer is spring-loaded. Remove the screws while holding the retainer against its spring load. Then slowly remove the retainer.
2. Remove spring (3) and piston assembly (4).
3. Remove piston o-ring (5). Do not remove the retaining ring and stem from the piston. The piston is serviced as an assembly.
4. Note and mark the position of control piston cover (7). Then remove the four screws (6) that secure the cover to the body.
5. Remove cover (7) and sealing ring (8), control piston (9), and spring (10).
6. Remove o-rings (11 & 12) from piston assembly.
7. Remove reservoir fitting (13) and o-ring (14).
8. Remove spring (15) and inlet/exhaust valve (16).
9. Remove the pipe plugs that retain the three single check valves. Two check valves are in the body, and one is in the cover (7).
10. Remove check valve springs (17) and rubber check valves (18).
11. With a pair of I.D. snap ring pliers, remove the snap ring (19) in the end of the reservoir fitting check valve assembly. Remove spring seat (20), spring (21), and check valve (22).
12. Remove screw (23), washer (24), and diaphragm (25) from the exhaust port.
1. Twist the springs (17) on each of the check valves (18). Drop the assemblies into their respective bores in the valve body and install the pipe plugs. Torque the plugs to 140-170 inch pounds.
2. Place reservoir fitting (13) upright, pipe threads down. Drop check valve (22) into place. Install check valve spring (21), spring seat (20), and snap ring (19). Install o-ring (14) into fitting.
3. Install inlet/exhaust valve (16) into valve body. NOTE: The side with four protruding ears rests against the seat in the body.
4. Place spring (15) in position on the inlet/exhaust valve. Make sure the spring rests evenly on the four ears of the inlet/exhaust valve and the rubber protrusion on the valve fits into the spring's inner diameter.
5. Properly align the inlet/exhaust valve springboard in the recess at the end of the reservoir port fitting (13). Install the fitting into the valve body. Torque to 200-300 inch pounds.
6. Install o-rings (11 & 12) into their respective grooves in the control piston (9).
7. Drop and position the spring (10) into the valve body.
8. Make sure all parts are properly aligned, and install the control piston (9) into the valve body.
9. Install sealing ring (8) in the cover (7), and install cover onto valve body, using the identification made in DISASSEMBLY step 4. Torque screws (6) to 40-60 inch pounds.
10. Install o-ring (5) in its groove in the pressure protection piston (4). Install the piston assembly into the valve body.
11. Position the spring (3) and spring retainer (2) on top of the pressure protection piston assembly, and secure it with the four screws (1). Torque to 20-30 inch pounds.
12. Install diaphragm (25), washer (24) and screw (23) into the exhaust port. Torque screw to 15-25 inch pounds.

CLEANING AND INSPECTION

1. Inspect all parts for excessive wear or deterioration. Inspect valve seats for nicks or burrs. Check the springs for cracks or corrosion.
2. Inspect the bores of the valve housing for deep scuffing or gouges.

Replace all non-metallic parts and any part not found to be serviceable during inspection, using only genuine Bendix replacement parts.

ASSEMBLY

Before assembling the Bendix® SR-5™ valve, lubricate all o-rings, o-ring grooves, piston bores, and metal-to-metal moving surfaces with Bendix silicone lubricant BW-650-M piece number 291126.

NOTE: When using pipe thread sealant during assembly and installation, take particular care to not allow the sealant to get into the valve itself. Apply the sealant beginning with the second thread back from the end.

NOTE: BEFORE PLACING THE VEHICLE BACK INTO SERVICE, PERFORM "OPERATIONAL AND LEAKAGE TESTS," LISTED IN THIS MANUAL.